

WHAT IS CLAIMED IS:

1. A clutching mechanism comprising:

at least one elastic layer which is a thin layer with a rim area
5 surrounding a deformable area; two sides of said elastic layer
defining an upper surface and a lower surface;

at least two protrusions erected on said lower surface of said
deformable area of said elastic layer(s) and extended outwardly; a
tip of each of said protrusions defining a clutching point; said
10 clutching points being separated at a predetermined distance;

a supporting mechanism anchored on said upper surface of said
elastic layer(s) in said rim area; and

a driving mechanism deforming said elastic layer in a way that
said deformable area is sunken inwardly, and thereby said clutching
15 points of said protrusions moving closer to each other within a
distance shorter than said predetermined distance.

2. The clutching mechanism of claim 1, wherein said elastic
layer(s) is made of elastic silica gel materials.

3. The clutching mechanism of claim 1, wherein said elastic
20 layer(s) is a round thin layer and said supporting mechanism is a
hollow tube, a rim of a cross section of said hollow tube being fixed
to said rim area of said upper surface of said elastic layer(s), said
protrusions are arranged uniformly in a pattern of an equilateral
polygon in said deformable area on said lower surface of said elastic
25 layer(s).

4. The clutching mechanism of claim 1, wherein said elastic layer(s) is a rectangular thin layer; said supporting mechanism consisting of two parallel rectangular walls anchored respectively along two opposite sides of said rim area on said upper surface of said elastic layer(s); said protrusions being arranged in parallel in
5 said deformable area on said lower surface of said elastic layer(s).

5. The clutching mechanism of claim 1, wherein the shape of said protrusions is selected from a group of a cone, a cylinder, a sloped-top cylinder, a rectangular body, and a triangular cone.

10 6. The clutching mechanism of claim 1, wherein said driving mechanism is a vacuum pump.

7. The clutching mechanism of claim 1, wherein said driving mechanism is a pair of charged electrodes.

8. A clutching mechanism comprising:

15 at least two elastic layers which are thin layers and are adjacently placed; each of said elastic layers having an outer rim area and an inner deformable area; two sides of each of said elastic layers defining an upper surface and a lower surface;

at least two protrusions respectively erected on said lower
20 surface in said deformable area of said elastic layers and extended outwardly; a tip of each of said protrusions defining a clutching point; said clutching points being separated at a predetermined distance;

at least two supporting mechanisms respectively anchored in
25 said rim area on said upper surface of each of said elastic layers; and

at least one driving mechanism deforming said elastic layers in a way that said deformable areas is bulged outwardly, and thereby said clutching points of said protrusions moving closer to each other within a distance shorter than said predetermined distance.

5 9. The clutching mechanism of claim 8, wherein said elastic layers are made of elastic silica gel materials.

10 10. The clutching mechanism of claim 8, wherein said supporting mechanisms are each a hollow tube, a rim of a cross section of said hollow tube being adhered to said rim area of said upper surface of each of said elastic layers.

11. The clutching mechanism of claim 8, wherein said the shape of said protrusions is selected from a group of a cone, a cylinder, a sloped-top cylinder, a rectangular body, and a triangular cone.

15 12. The clutching mechanism of claim 8, wherein said driving mechanism is a pneumatic pump.